Electric Power Marketing EIS UPDATE

for the
Salt Lake City Area Integrated Projects

May 1, 1992

Summary of Alternatives - Electric Power Marketing EIS

This issue of Western Area Power Administration's (Western) *EIS Update* summarizes the Salt Lake City Area (SLCA) Office's alternatives for the SLCA Integrated Projects (SLCA/IP) Electric Power Marketing EIS. The *EIS Update* is a periodic newsletter designed to keep you informed on the progress of the SLCA/IP Electric Power Marketing EIS. Previous *EIS Updates* presented the issues that the interested public identified through the formal scoping process and discussed Western's responses to comments received during that process.

Western also will host five public information meetings to explain the alternatives and to continue providing you with opportunities to be involved in this EIS process. Additionally, Western is interested in hearing your response to our decisions regarding the alternatives and your thoughts on any other issues you deem important. Following the last public meeting on alternatives (June 10, 1992), we will offer the public 4 weeks to provide us feedback about whether we have developed an appropriate range of reasonable alternatives necessary to assess adequately the environmental impacts of potential actions. The SLCA/IP Electric Power Marketing EIS alternatives must cover the range of possible outcomes but not necessarily every potential alternative. Also, please understand that Western is not seeking a vote on these alternatives. Rather, we are asking your help to ensure that what we are proposing to analyze is adequate.

As an aid while you are reviewing this document, we have included a brief glossary of some of the technical terms used in describing the alternatives.

BACKGROUND **The SLCA/IP Marketing EIS** resulted from the need to address several issues and concerns. These include (1) Western's decision to avoid prolonging costly and contentious litigation, (2) to provide an opportunity for better public understanding of Western's programs, (3) to settle concerns customers may have about their long-term power supplies, and (4) to ensure adequate compliance with the National Environmental Policy Act (NEPA). Western filed its "Notice of Intent" to prepare an EIS in April 1990.

From October through December 1990, Western held seven scoping meetings in five cities. About 21,000 comments were received during the scoping period. Major issues identified by the public focused on 11 concerns and suggestions for analysis:

- The Overall Scope of the EIS
- Economics of Power
- Power Rates
- Environmental Resources
- Recreational Resources
- Conservation
- Individual's Values of the Resources
- Statutes and Legal Relationships
- Marketing Criteria
- Cooperating Agencies
- Geographic Scope

As a result of scoping and in an effort to clarify directions provided by Judge Greene in his order in the *National Wildlife Federation et al.* v. *Western Area Power Administration et al.* lawsuit, Western developed an EIS "statement of

(*continued on page 3*)

SLCA/IP Electric Power Marketing EIS
Public Alternatives Presentations

June 2	7 p.m.	Salt Lake City	**Red Lion Hotel** 255 South West Temple Salt Lake City, UT 84101
June 3	7 p.m.	Phoenix	**YWCA of the USA** 9440 North 25th Avenue Phoenix, AZ 85021
June 4	7 p.m.	Flagstaff	**Flagstaff High School** 400 West Elm Flagstaff, AZ 86001
June 9	7 p.m.	Albuquerque	**Albuquerque Convention Center** 401 2nd Street, NW Albuquerque, NM 87102
June 10	7 p.m.	Denver	**Denver West Marriott** 1717 Denver West Marriott Blvd. Denver, CO 80401

Need and Purpose for Action

INTRODUCTION **The mission** of Western Area Power Administration (Western) is to sell the power and energy available from powerplants that are features of certain Federal water projects. Most of the existing contracts for the sale of long-term firm power and energy from three of those projects—the Colorado River Storage, Collbran, and Rio Grande Projects—were to expire in September 1989.

In the early 1980s, Western initiated a public process of developing the criteria governing the post-1989 sale of long-term firm power and energy from those projects. On February 7, 1986, Western published a *Federal Register* notice on the Post-1989 General Power Marketing and Allocation Criteria and Call for Applications of Power (Post-1989 Criteria) from those projects, which are collectively referred to as the Salt Lake City Area Integrated Projects (SLCA/IP). Western proceeded to develop and negotiate contracts for the post-1989 sale of long-term firm power and energy in accordance with the Post-1989 Criteria.

The Post-89 Criteria were supported by an environmental assessment and a U.S. Department of Energy Finding of No Significant Impact dated January 8, 1986. The adequacy of the National Environmental Policy Act (NEPA) compliance, among other points, was challenged by Utah Power & Light Company and a number of its customers in the lawsuit, *Salt Lake City, et al.* v. *Western Area Power Administration, et al.*

As settlement was proceeding in that lawsuit, the adequacy of the NEPA compliance was again challenged in *National Wildlife Federation, et al.* v. *Western Area Power Administration, et al.*, Civil No. 88-C-1175J,D. Utah (1989).

In this same timeframe, the Secretary of the Interior announced on July 27, 1989, that the Bureau of Reclamation (Reclamation) would prepare an environmental impact statement (EIS) on its operations at Glen Canyon Dam. Glen Canyon Dam Powerplant represents 72 percent of the marketable SLCA/IP power and energy. Changes in Reclamation's operations at Glen Canyon could affect Western's decisions concerning the sale of long-term firm SLCA/IP power and energy. In consideration of the action by the Secretary of the Interior, in order to end further contentious litigation as well as to provide an opportunity for better public understanding of Western's programs, Western announced that it would prepare an EIS on its Post-1989 Criteria.

The U.S. District Court for the District of Utah (Central Division) agreed to allow the implementation of the post-1989 contracts, but ordered the aggregate level of the firm power and energy commitment to remain essentially the same as it was for the previous contracts until Western had completed its EIS. The Court was concerned that the change in that commitment, which was a principal feature of the Post-1989 Criteria, could result in a changed operation of the SLCA/IP hydroelectric powerplants with resulting downstream environmental impacts that should be addressed in an EIS.

The need statement below stems in part from the fact that while the Court's order permitted the post-1989 contracts to become effective, neither the post-1989 level of commitment nor any alternative commitment level can be implemented until Western completes an EIS.

In addition, the need statement reflects two additional considerations. First, Reclamation is engaged in various NEPA and administrative processes that may lead to changes in the operating parameters at several SLCA/IP dams and powerplants. Any such changes implemented by Reclamation could affect Western's decisions concerning the appropriate level of long-term power and energy commitments to be made to Western's customers. In making its decision, Western needs to consider those potential changes in operations and reasonable commitments of long-term firm power and energy associated with those changes.

Second, the amount of long-term firm power and energy to be marketed forms the basis not only for the long-term firm contracts, but also for the other SLCA/IP power sales programs. An analysis of the downstream environmental impacts associated with any particular long-term, firm commitment level necessarily includes an analysis of the downstream environmental impacts of all other SLCA/IP power sales programs that would coexist with that firm commitment level.

NEED **Western** needs to determine the level of long-term, firm power and energy commitment from the SLCA/IP, which Western will make available to its customers and which will form the basis for its SLCA/IP power marketing program.

PURPOSE **The alternative** selected by Western must be consistent with its statutory obligations and legal constraints.This requires a weighing of business, environmental, and other public considerations. Western's actions will achieve a balanced mix of purposes as follows:

- **Provide** the greatest practicable amount of long-term firm power and energy.
- **Provide** meeting of firming requirements as practicable by purchases of power and energy.
- **Provide** long-term resource and contractual stability.
- **Provide** the greatest practicable value of the power resource.
- **Result** in the least practicable associated adverse environmental impacts.
- **Be responsive and adaptable** to likely operations of SLCA/IP facilities.
- **Be responsive** to decisions from Reclamation's Glen Canyon Dam EIS and the Energy Planning and Management Program EIS now being prepared by Western.

PUBLIC INVOLVEMENT

FOLLOWING THE COMMENT PERIOD ON THE ALTERNATIVES, THE NEXT OPPORTUNITY FOR PUBLIC INVOLVEMENT WILL BE IN SEPTEMBER AND OCTOBER 1993, FOLLOWING PUBLICATION OF THE DRAFT EIS. WESTERN ENCOURAGES YOUR INPUT THROUGHOUT THE EIS PROCESS.

Background (*Continued from page 1*)

scope." Within this document, Western stated that it would:

- **Identify** the interrelationships among the SLCA marketing objectives, marketing and allocation criteria, other marketing programs, and operation of the applicable hydroelectric facilities for hydropower generation.
- **Delineate** marketing alternatives and programs once those interrelationships are understood.
- **Analyze** the effects of the alternatives on the operation of the applicable hydroelectric facilities.
- **Analyze** the impact of the operation of the hydroelectric facilities on the downstream environment.

Western held public information meetings in Phoenix and Flagstaff, Arizona, and Salt Lake City, Utah, to discuss and describe the statement of scope with the interested public. In general, it was well received by the public; no comments were received to cause Western to change its approach.

PROGRESS TO DATE

Because Western's statutory responsibility is to sell Federal hydropower from the SLCA/IP, the alternatives are designed around Western's power marketing responsibilities. Additionally, the scoping process identified numerous issues regarding operation of the SLCA/IP facilities that the public believed should be assessed within the EIS. Western has identified the interrelationships of Western's sale of Federal hydropower to operation of the individual SLCA/IP facilities and will assess the environmental impacts for a range of power supply options to meet the requirements for the various power marketing alternatives, including the output from hydropower generation at the SLCA/IP facilities. However, Western's analysis will only address SLCA/IP powerplants and their operations that could be influenced by the sale of hydropower. This EIS will not include analysis for other dam operations, such as irrigation, flood control, or review of the Annual Operating Plan (AOP) under the direct control of the Bureau of Reclamation.

ALTERNATIVES FOR THE SLCA/IP ELECTRIC POWER MARKETING EIS

Western's statutory responsibilities include (1) power marketing, construction, operation, and maintenance of transmission lines and attendant facilities, and (2) setting power rates to ensure that revenues are sufficient to repay all allocated investment. Western's primary responsibility, and therefore its primary program, is to sell firm power and energy. All other power sales programs depend on the residual power and energy

Figure 1

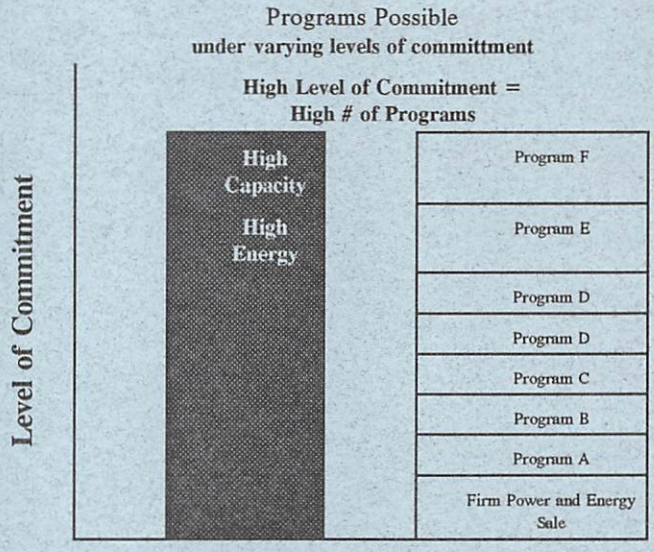


Figure 2

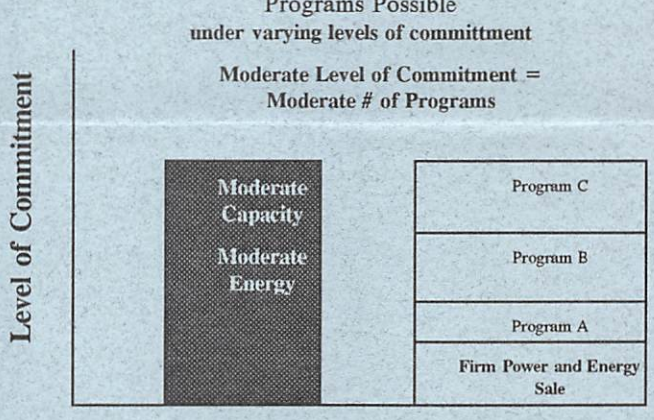


Figure 3

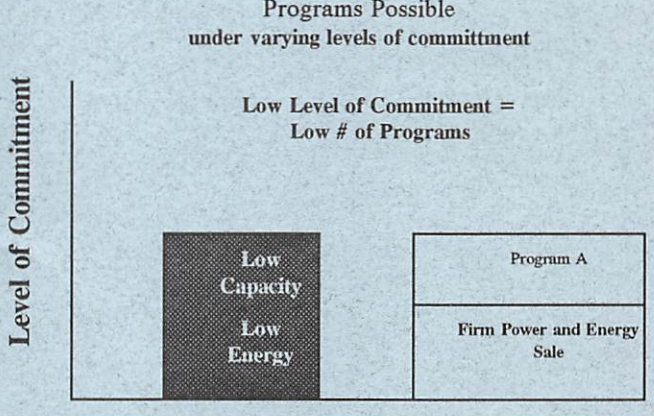


TABLE 1

COMMITMENT-LEVEL ALTERNATIVES

Alternative No.	Operation Type	Power Commitment (MW)	Energy Commitment (GWh)	Load Factor (percent)	Description
2	Peaking	1,450	3,300	26	The highest peaking alternative with a high-power commitment, but a low-energy commitment.
1		1,449	6,156	48.5	Originally the Proposed Action alternative with high power and energy commitment levels.
3		1,225	4,000	37	Risk of supply is lessened with lower power and energy commitment levels.
No Action		1,291	5,700	50	The 1978 marketing program commitment level-lower capacity and high energy levels.
4		550	3,300	68	The lowest supply risk commitment levels.
6		1,000	4,750	54	A moderate level of supply risk alternative.
5	Base Load	625	5,475	100	The alternative that provides the energy equivalent of generation at a steady mode of powerplant operation.

left after the sale of firm power.[1] The simplest way to view alternative marketing programs is to focus first on the amount of power Western will commit to be sold on a firm basis. In this manner, the most important aspect of a marketing program is covered; for this reason, we call these alternatives "commitment-level alternatives."

Western markets the firm power and energy generated from the hydroelectric dams of the SLCA/IP as well as supplemental energy. Certain amounts of power and energy are reserved for use by Reclamation for its various projects, and small amounts of power and energy are lost because of heat and transmission system inefficiencies. Once these are all accounted for, Western markets the remaining power and energy.

Though this process may seem straightforward, it does involve uncertainty. Western calculates the amount of resource available to be sold assuming that enough water will be available for power generation to meet commitments. As the recent drought shows, water may not always be available. Because Western has the capability to purchase energy to supplement its hydro resource in dry years, the risk that it might assume for committing firm power and energy based on normal water year conditions can be minimized.

Programs for other than long-term firm power or energy sales (for example, short-term firm or short-term nonfirm) that Western may choose to implement depend upon the residual power and energy available after the sale of long-term firm power and energy, additional sales of surplus energy to firm-power customers, and the services required by Western's customers. Figure 1 conceptually shows the programs that could be available to Western given the commitment of a high-level power and energy; Western would also have a high degree of operational flexibility to administer these programs. Figure 2 shows what programs might be available with the commitment of a moderate level of power and energy. Finally, with only a low level of power and energy available, Western could conceivably have very few other programs except during above-normal water years (see Figure 3) because Section 7 of the Colorado River Storage Project (CRSP) Act requires that Western market "the greatest practicable amount of power and energy that can be sold at firm-power and energy rates."

Because individual programs are based on resource availability, the draft EIS will provide some description of the basis for program selection. However, alternative evaluation and analysis will only be performed on the basis of the total available resources under various alternative commitment levels.

ALTERNATIVES Western proposes to evaluate seven alternative commitment levels. These alternatives cover a range of combinations of both energy and power that could be available from SLCA/IP resources. These alternatives are summarized in Table 1. Note that although the basis for the level of commitment is the capability of the SLCA/IP facilities, the actual source may be in part purchased resources from outside of Western's system.

Western will analyze the direct and secondary environmental impacts of these six alternatives and the No-Action Alternative by addressing the changes, both specific and regional, that would occur as a result of each alternative. The scope of such environmental assessments are discussed in a later section of this document.

Relationships of Marketing Programs to Dam Operations Depending upon combinations of program elements, some power marketing programs can have large or small effects upon dam operations. Others have little or no effects on dam operations under any

[1] Western also is responsible for all power dispatch functions within a designated portion of the interconnected bulk electric power system (control area). This includes such responsibilities as assigning of load to specific generating stations and other sources of supply, providing such assignments can be made within water and operating constraints set by Reclamation. Western maintains transmission system reliability and provides power to its customers to replace power lost during scheduled and unscheduled unit maintenance, reserves, power pooling, generation displacement services, exchange (Salt River Project Exchange Agreement), planning, hydrothermal integration, and firm and nonfirm transmission service. Western also provides transmission, switching, necessary wheeling arrangements, and substation service for Reclamation's projects, including project use power.

circumstances and combinations. Transmission programs and services can have a direct impact on dam operations under all program configurations when line capacity limits dictate operations. In some conditions, such as extremely wet weather (high-reservoir inflow) coupled with full or near-full reservoir conditions, the dams are operated at maximum capacity just to release enough water to avoid spills. In this instance, all marketing program elements have little or no effect on dam operations. The following section provides a brief explanation of each of these phenomena.

• **Linkage Between Firm Contracts and Dam Operations:** For each hour of every day of the year, Western is obligated to supply its firm-power customers with electricity as stipulated in its short- and long-term firm contracts. The total quantity of electricity that Western must supply on a monthly basis and the minimum schedule requirement are also specified in these contracts. Within contractual limits, hourly deliveries within each month are determined by the customers. Customers place orders for hourly energy deliveries with the dispatch center in Montrose, Colorado, at least 1 day in advance of deliveries.

Western meets its firm delivery obligations by generating electricity from SLCA/IP hydroelectric resources as supplemented by purchasing or interchanging electricity with other utilities when necessary. Western usually makes purchase and interchange transactions under most hydrological conditions, even when those conditions permit Western to meet all its firm energy commitments solely with SLCA/IP resources. As an operating philosophy with adequate flexibility in hydrogeneration, Western will typically purchase some electricity during off-peak hours; this enables Western to store water and then to release it during on-peak hours. After meeting firm load, market conditions usually allow Western to generate this stored energy when it has more value during on-peak hours more than offsetting the cost of the purchased energy during off-peak hours. This practice is consistent among utilities and represents a sound business principle. Western markets this nonfirm energy to both preference and nonpreference (investor-owned utilities) customers. Revenues generated through nonfirm sales generally defer increases in firm-power rates and repay project investment to the U.S. Treasury faster.

Purchases and interchange also lead to hourly generation patterns that, at times, differ from firm loads. If Western did not have the option to purchase and interchange power and energy, the remaining single source of supply (SLCA/IP hydrogeneration) would result in a high correlation between Western's firm loads and powerplant operations. Also, without purchases and interchanges, any Western program element that affects firm loads would be closely linked to powerplant operations. However, the availability of the purchasing and interchange program leads to dam operations only very weakly related to Western's firm-power commitments.

• **Effects of Regulation, Emergency Services, and Outage Assistance on Dam Operations:** Western provides load control service for the Western Area Upper Colorado (WAUC) control area. As part of this service, Western must respond to instantaneous changes in system frequency with up to about ±2½ percent of its load or 56 megawatts (MW) of generation. If Glen Canyon Dam is used to regulate the system, this translates into a maximum potential flow fluctuation of about 1,400 cfs.

Western's spinning reserve requirement for WAUC varies across months and is about 45 to 60 MW, depending upon a number of factors related to the Inland Power Pool (IPP) agreement loads and resources. Spinning reserves are used to replace electrical generation shortfalls quickly that result from a forced outage such as the sudden loss of a major transmission line or generation resource. When Glen Canyon Dam provides spinning reserve services, an emergency situation could result in a maximum flow increase of 1,600 cfs in less than 10 minutes. Western is obligated to provide emergency services for up to 72 hours after an outage occurs. Generally, the provision of emergency services is only for short periods (1 hour or less). If an IPP member requires assistance beyond 72 hours or needs to replace capacity and energy for a unit going off-line for scheduled maintenance, Western can, at its own discretion, sell the member scheduled outage assistance.

Fluctuations in operations attributable to regulation and emergency services are typically not affected by the configuration of Western's other programs. Fluctuations attributable to these services and programs are generally smaller and of shorter duration than fluctuations attributable to purchases and interchange.

• **Transmission Considerations and the Salt River Project (SRP) Exchange:** Western's transmission lines transport electricity from generating sources to customer utilities that service end-users (for example, a residential consumer). Western uses its transmission capabilities to deliver electricity to its customers and sells the excess to other utilities. Both hydroelectric and thermal generation is affected by transmission limitations when lines do not have enough capacity to transport electricity from the point of generation to the point of demand. Line limitations directly influence the dispatching of generating facilities, spot-market transactions, and interchanges of electricity.

Most (72 percent) of Western's SLCA/IP generating resources are located at Glen Canyon Dam in northern Arizona, while many of Western's loads are located in Utah, Colorado, and New Mexico. The Glen Canyon-Kayenta-Shiprock transmission line, used to link Glen Canyon with these major areas of load, has a capacity of only 300 MW. To avoid this transmission limitation, Western and SRP have an "exchange" arrangement in which generating capacity owned by SRP in Colorado is exchanged for Western generating capacity at Glen Canyon Dam. Without the power exchanges with SRP, Western would not be able to serve its loads east of Glen Canyon without constructing additional transmission lines. During times of peak loads, limits on the Glen Canyon-Kayenta-Shiprock line may restrict operating levels at many or all SLCA/IP hydroelectric dams.

• **Hydrologic Variability and Dam Operations:** Water conditions also play a major role in dam operations. For example, under very wet and full-reservoir conditions, only one operating mode is possible regardless of Western's programs: electricity is generated at the maximum capacity level at all times. Most hydrologic conditions, however, allow for a wide range of operational regimes if they could be implemented independent of Western's programs.

Currently hydrogeneration and dam operations are predicated on maximizing the value of the generating resource within operating constraints. Therefore, for other than very wet and full-reservoir conditions, generation patterns are configured to increase generation as load increases and decrease generation as load is reduced (load following).

RESOURCE OPTIONS FOR MEETING THE REQUIREMENTS OF THE COMMITMENT-LEVEL ALTERNATIVES

Meeting the resource requirements for each commitment-level alternative necessitates using either the hydropower generated at each SLCA/IP facility or a combination of hydropower plus power and energy purchases from sources outside of Western. As indicated within the EIS statement of scope, Western "would analyze the effects of alternatives on the operation of the applicable hydro facilities." To assess adequately the environmental impacts of operations of those SLCA/IP facilities, Western delineated resource supply options. Those resource supply options—hydrogeneration plus the purchase of power and energy—are discussed in the following sections.

Western, in conjunction with Reclamation, has evaluated the operation of each dam that generates hydropower in the SLCA/IP. As mentioned, Western is analyzing the environmental impacts of meeting the resource requirements for the commitment-level alternatives, including operating SLCA/IP facilities for hydropower generation. Fundamental to this evaluation is recognizing the influence, or lack thereof, that Western exercises on each SLCA/IP facility for hydrogeneration. Certain facilities are operated for specific project purposes (generally irrigation water service) with no consideration of hydropower generation other than as a byproduct of the release of water. Neither Western nor its marketing programs influence the operation of those particular facilities. Conversely, Western has direct influence over the second-by-second and hourly operation for certain facilities within certain parameters prescribed by Reclamation.

Generation parameter options are described for those specific SLCA/IP facilities directly influenced by Western. For those facilities for which operations are dictated by other factors, such as irrigation, M&I water, or flood control, Western will not describe operations and will not proceed to conduct a site-specific environmental analysis. Where generation levels from all of these facilities fall short of the requirement of the commitment-

TABLE 2

OPERATIONAL OPTIONS TO SUPPORT SLCA/IP MARKETING ALTERNATIVES

	MINIMUM RELEASE	MAXIMUM RELEASE	MAXIMUM DAILY FLUCTUATION	RAMP UP	RAMP DOWN	BIOLOGICAL OPINION COMPLIANCE
Flaming Gorge						
No-Action	800 cfs	4,900 cfs	No limit	4,100 cfs/hr	4,100 cfs/hr	NO
High Fluctuation	800 cfs	4,900 cfs	No limit	4,100 cfs/hr	4,100 cfs/hr	YES
Moderate Fluctuation	1,000 cfs	3,000 cfs	2,000 cfs	2,000 cfs/hr	4,100 cfs/hr	YES
Monthly Adjusted Steady Flows	Steady Flows — No Fluctuations			None	None	YES
Aspinall						
No Action						N/A
Crystal	300 cfs	1,600 cfs	1,300 cfs	1,300 cfs/hr	1,300 cfs/hr	
Morrow Point	0 cfs	5,300 cfs	5,300 cfs	5,300 cfs/hr	5,300 cfs/hr	
Blue Mesa	0 cfs	3,700 cfs	3,700 cfs	3,700 cfs/hr	3,700 cfs/hr	
Crystal Steady						N/A
Crystal	Steady Flows — No Fluctuations			None	None	
Morrow Point	0 cfs	5,300 cfs	5,300 cfs	5,300 cfs/hr	5,300 cfs/hr	
Blue Mesa	0 cfs	3,700 cfs	3,700 cfs	3,700 cfs/hr	3,700 cfs/hr	
Moderated Fluctuations						
Crystal	Steady Flows — No Fluctuations			None	None	
Morrow Point	0 cfs	5,300 cfs	4,200 cfs	9,200 cfs/hr	4,200 cfs/hr	
Blue Mesa	0 cfs	3,700 cfs	2,900 cfs	2,900 cfs/hr	2,900 cfs/hr	
Steady Flows						N/A
Crystal	Steady Flows — No Fluctuations			None	None	
Morrow Point	Steady Flows — No Fluctuations			None	None	
Blue Mesa	Steady Flows — No Fluctuations			None	None	

level alternative, Western will assume that power and energy are supplemented to the required level from other sources (purchases, exchanges, etc.). A description of each facility follows, and dam operation options for those facilities to be assessed in the EIS are summarized in Table 2.

Glen Canyon Dam: Western's Montrose Power Operations Center (MPOC) is directly connected to the Page, Arizona, control center for Glen Canyon, Flaming Gorge, and Aspinall Unit powerplants. Glen Canyon Dam is the subject of an ongoing EIS and, as such, alternative operations have been described. Western proposes to use the seven alternatives described within that process. A description of these alternatives may be found in the January 1992 "Colorado River Studies Office" newsletter and is available from Reclamation in Salt Lake City, Utah. If a copy of that newsletter is desired, please telephone Kate O'Hare at (801) 524-4099.

Western will not repeat the analysis performed in the Glen Canyon Dam EIS (GCD-EIS). However, whenever Western believes additional analysis is required to meet the needs of the SLCA/IP Electric Power Marketing EIS, such analysis will be included and described. Western anticipates that much of the additional analysis will revolve around the level of economic evaluation performed for the GCD-EIS.

Flaming Gorge Dam: Flaming Gorge Dam is also computer linked through automatic generation control (AGC) with Page, Arizona. The facilities and flows can respond to the electrical system demands; therefore, Western proposes that four options be evaluated for Flaming Gorge Dam operation in the EIS. Also, certain constraints on Flaming Gorge Dam operations have been suggested by the U.S. Fish and Wildlife Service (FWS) in a draft biological opinion. The constraints stipulated within the biological opinion have been addressed within the range of options for the dam.

Aspinall Unit: The three facilities of the Aspinall Unit—Blue Mesa, Morrow Point, and Crystal—have AGC. Further, with the exception of Crystal Powerplant (a regulating dam), the Aspinall Unit historically has been used by Western for regulation and load-following purposes. This would suggest that the facilities of the Aspinall Unit are candidates for an impact analysis. Currently, FWS, Reclamation, and Western have been discussing changes in operations at Crystal Dam for research on endangered fish. Additionally, the National Park Service has an interest in flows through the Black Canyon of the Gunnison.

The three Aspinall Unit powerplants are located in such close proximity that a change in the operations of one facility affects the operations of the other two, both upstream of Morrow Point and Crystal Powerplants and downstream. Aspinall generation options will be characterized in terms of a modified operation pattern at one or more of the Aspinall facilities. For a generation option that is characterized by modified operation at just one facility, it should be understood that this will affect the operation of the other two and that this will be a subject of impact analysis.

Other SLCA/IP Facilities: Western's SLCA Office markets power generated at other facilities in CRSP and the associated Integrated Projects. As mentioned, certain facilities are operated for other purposes than generating electrical power and energy. These facilities include:

1. Fontenelle Dam
2. Collbran Project
   a. Upper Molina Powerplant
   b. Lower Molina Powerplant
3. Rio Grande Project
   Elephant Butte Dam
4. Provo River Project
   Deer Creek Powerplant
5. Falcon and Amistad Powerplants
6. Dolores Project
7. Navajo Dam (has no Federal hydrogeneration)
8. Dolores Project
   a. Towaoc Canal
   b. McPhee Dam

After thoroughly researching the operation of these other SLCA/IP facilities, Western has found that Reclamation operates these facilities to provide such services as irrigation and flood control; where power generation is available, it is a byproduct of its operations. While Elephant Butte Dam has occasionally been called upon to provide specific flows for power generation, its current and foreseeable future operation is one in which power production is merely incidental to other purposes. Therefore, because Reclamation exercises the operational control of these facilities and Western's electric power marketing will not influence operations at these facilities, Western will not analyze their operational impacts to the enviornment.

NATURAL RESOURCE ASSESSMENT

The SLCA/IP Electric Power Marketing EIS will examine the impacts to natural resources of Western's commitment levels of power and energy to support power marketing programs and probable modes of dam operations for hydropower generation. Essentially, Western intends to quantify the difference in environmental impacts between the No-Action alternative and all other alternatives. Western does not intend to analyze the impacts of installing the dams or do a comparison of the operation of the dams to a predam condition. The SLCA/IP powerplants to be evaluated in the EIS are those whose operations could be influenced by Western's power marketing programs (that is, Glen Canyon, Flaming Gorge, and the Aspinall Unit). Impacts to resources downstream of these affected dams will be a primary focus of the natural resource assessment in the EIS. Also to be examined are impacts to natural resources in the six-state study area that result from program-influenced changes in thermal power generation, irrigation (which uses SLCA/IP power), or socioeconomic characteristics. For each affected dam (that is, Glen Canyon, Flaming Gorge, and the Aspinall Unit), the assessment will evaluate varying hydropower operations that specify maximum release, minimum release, maximum daily fluctuation in flow, and up- and down-ramp rate limits. The following brief discussion outlines the approach to be used to assess impacts to natural resources.

Air Resources: The EIS will examine both (1) the influence of Western's power marketing programs on power generation at thermal powerplants within the region and (2) the subsequent effect on air-pollutant emission levels. Air quality impacts will be assessed in terms of local impacts on ambient air quality, regional impacts such as visibility and acid deposition, and global impacts such as potential global warming.

Water Resources: The impacts of hydropower operation alternatives on downstream water resources will be

evaluated in the EIS. Water releases for hydropower generation under each operational option will be estimated for different hydrological conditions (for example, wet years, dry years) and marketing programs. Impacts to the following river characteristics will be evaluated: flow, stage, sediment load, erosion and aggradation of beaches and other deposits, and temperature.

Ecological Resources: The ecological resource assessment in the EIS will focus on the impact of changed hydropower operation options on downstream or upstream of Morrow Point and Crystal reserviors in the case of the Aspinall Unit resources. The assessment will rely heavily on the changes from the no-action operation baseline predicted in the water resource assessment. Of particular interest will be the effect of hydropower generation on flow-dependent habitats downstream of affected dams. In-stream habitats to be examined include backwaters that may provide suitable spawning and nursery habitats for various fish species, pool and rapid habitats, and benthic habitats (for example, gravel bars and shoreline areas). Shoreline habitats to be examined include beach areas, marshes and other wetlands, and riparian habitats. Remotely sensed data such as aerial photographs will be used to establish the relationships between flow and the habitats of interest. These relationships will then be applied to predict the impacts of hydropower generation on these resources. The results of this impact assessment will be used to determine the impacts to aquatic and terrestrial species dependent upon these habitats. Although threatened, endangered, and other protected or sensitive species will be the focus of the ecological impact assessment, other species dependent on riverine resources (both game and nongame) will be considered in the analysis.

Cultural Resources: Hydropower generation may potentially affect cultural resources. Cultural resources to be examined in the EIS include archeological and historic sites, structures, and features, and those resources of cultural or religious significance for Native American groups potentially affected by powerplant operations. Adverse effects to cultural resources that may be linked to changes in hydropower generation include stream erosion and vandalism (impacts from vandalism are potentially linked indirectly to hydropower operation through its effects on recreation). Cultural resources in affected areas will be inventoried and evaluated through an analysis of existing literature and file data compiled from previous filed surveys. Resources of cultural/religious significance to Native Americans will be inventoried and evaluated through consultation with potentially affected Native American groups. Adverse effects will be assessed by direct examination of previously recorded sites, structures, and features. Depending upon the scope of the impacts observed, new field surveys may be required to achieve an adequate inventory and evaluation of affected cultural resources.

RECREATION, LAND USE, AND VISUAL RESOURCES

The EIS will examine the potential impacts of changed hydropower operation on recreational resources, land-use patterns, and visual resources downstream of affected dams. Of these resources, recreation is perhaps the most likely to be affected by hydropower generation and will be the focus of this section of the EIS. Recreational activities most closely tied to hydropower releases are rafting and other forms of boating, riverside camping, and fishing. Hiking, horseback riding, picnicking, and other activities may also be affected to a limited degree by changes in flow. Existing information on the recreational use of downstream areas will be examined to determine the relationship between flows and recreational use. Projected changes in flow will then be used to determine impacts to recreational resources. Relationships between flow, land use, and visual resources also will be evaluated. Because most of the land use in the affected area is recreational, little additional analysis will be required. The assessment of impacts to visual resources will be largely qualitative and will focus on the effects of changes in flow on aesthetic values.

ECONOMIC IMPACT ASSESSMENT

The economic impact assessment will incorporate a power systems cost analysis, a utility financial impact analysis, a rate impact analysis, a regional economic analysis, an incorporation of conservation and renewable energy programs, and an analysis of recreational and tourism impacts. The power systems cost analysis requires delineating the "power pools" in Western's service region, identifying differences between large and small systems, and selecting the "power pool" for the impacts assessment. The analysis will be based on a unit inventory, system loads and growth rates, generation probabilities, demand projections, fuel-cost escalation projections, capacity expansion planning, interpool sales and purchases, and wheeling practices. The analysis will use several different utility models to reflect least-cost expansion planning, transmission constraints on Western's system, and historical practices for dispatching hydroelectric resources to meet customers' load demands.

Because tourism and recreation are important components of the local and regional economics close to the SLCA/IP sites, particular emphasis will be placed on the potential effects of the marketing alternatives on recreation and tourism. The analysis of potential impacts to recreation will identify land-use patterns for various local recreational activities (for example, park visits, camping, hiking, and hunting) and water recreational activities (such as fishing, rafting, boating, and swimming). The analysis will also project how these land-use patterns might be affected under alternative marketing programs. The analysis and assessment of these impacts will include effects on local economic activity, employment, total revenue, and output (using regional gross national product measures). An analysis of these types of impacts will expand the scope of the EIS to include the potential for impacts that extend beyond those measured in traditional land-use assessments and those that focus purely on economic impacts measured through changes in employment and output.

PUBLIC INVOLVEMENT

As mentioned, Western would like to hear from you regarding these alternatives. Please provide your comments to Dave Sabo no later than July 10, 1992.

Western Area Power Administration
P.O. Box 11606
Salt Lake City, UT 84147

DEFINITIONS

AGC: (Automatic Generation Control/Load Frequency Control) The computer-controlled regulation of the power output of electric generators within a prescribed area in response to changes in the system frequency, control area load, system time error, and tie-line loading, so as to maintain the scheduled generation in accordance with prescribed criteria. Hydrogeneration is particularly suited to AGC due to its nearly instantaneous response time; thermal units are much slower to respond and cannot meet rapid demand changes.

Baseload: The minimum assigned load in a power system over a given period of time (see *Baseload Powerplant*).

Baseload Powerplant: A baseload powerplant, because of its design, is operated to maintain a near-constant output rating with little or no changes. Coal-fired and nuclear powerplants are examples of typically baseloaded powerplants.

Capacity: The rated output of a generator, and also the capability of a transmission line to carry power. Capacity is frequently used to define the amount of generation reserved for an entity's use under a contract. Capacity is measured in terms of watts, kilowatts, megawatts, etc.

Demand: The energy requirement (load) placed upon a utility's generation at any specific point in time. A utility's demand (i.e., energy needed) increases and decreases instantaneously as consumers turn on or off their electrical appliances. Demand is increased or decreased in terms of watts, kilowatts, megawatts, etc. Generation must always closely match demand, hence the need for AGC.

Downramp: Reduction in generation with a corresponding reduction in water release.

Energy: The force or action of doing work. Energy is converted into some other product such as heat or light. Measurements of energy generally reflect the quantity of power expended over a given period of time. A 60-watt light bulb uses 60 watts of electrical energy per hour.

Energy, Firm: Electric energy which is considered to have assured availability to the customer to meet all or any agreed upon portion of the customer's load requirements.

Energy, Nonfirm: Energy supplied or available under an arrangement which does not have the guaranteed continuous availability feature of firm power, generally [interruptible] on short notice.

Firm Power: Power that is guaranteed by the supplier to be available at all times except for reasons of certain uncontrollable forces or continuity of service provisions (see *Energy, Firm, and Power*).

Fluctuating Flows: Variation in water flows throughout the day due to changes in generation to accommodate load patterns.

Forced Outage: The nonscheduled shutting down of a generating unit or transmission line for emergency or other unforeseen reasons.

Frequency: The number of cycles through which an alternating current passes per second. Frequency has been generally standardized in the United States electric utility industry at 60 cycles per second (60 hertz).

Interchange Energy: Energy in kilowatthours delivered to or received by one electric utility system from another. It may be returned in kind at a later time or may be accumulated as energy balances until the end of a stated period. Settlement may be by monetary payment or energy.

Load: The amount of power or energy required at any specified point on a system. Load originates primarily at the energy consuming equipment/appliances of the individual consumer.

Load Factor: The ratio of the average load in kilowatts supplied during a designated period to the peak or maximum load in kilowatts occurring in that period. Load factor, in percent, also may be derived by multiplying the kilowatthours in the period by 100 and dividing by the product of the maximum demand in kilowatts and the number of hours in the period.

Load Frequency Control: See *AGC*

Load Patterns: Fluctuation in electrical usage as determined by the public.

Load Shaping: Either the arrangement and operation of generating resources to meet a given load or the arrangement of load to meet a given resource over specified periods of time. Load shaping on a hydrosystem usually involves the adjustment of storage releases so that the generation and the load are continuously in balance.

Minimum Schedule Requirements: The generation level that customers must accept during any hour. Minimum schedule requirements are related to the 35 percent minimum schedule requirements placed on SLCA/IP customers through the firm capacity/energy contracts. (Minimum release requirements are minimum generation restrictions placed upon Western at the powerplant to maintain a particular minimum c.f.s. flow in the river below the powerplant.)

Nonfirm Power: Power or power-producing capacity supplied or available under an arrangement which does not have the guaranteed continuous availability feature of firm power, generally interruptible on short notice.

Off Peak: Energy supplied during periods of relatively low system demand for electrical energy as specified by the supplier.

On Peak: Energy supplied during periods of relatively high system demands as specified by the supplier.

Peaking Capacity: Generating equipment operated during the hours of highest daily, weekly, or seasonal loads. Some generating equipment may be operated at certain times as peaking capacity and at other times to serve loads on a round-the-clock basis.

Peaking Power/Peaking Generation: Powerplant capacity which is typically used to meet rapid increases or the highest levels of demand in a utility's load or demand profile. Peaking generation is usually oil, gas fired, or hydropower generation.

Power: The measure of the amount of energy (work) being used at a specific point in time. Power is measured in terms of watts, kilowatts, megawatts, etc. Implies capacity in addition to energy.

(Continued on page 10)

Definitions (continued from page 9)

Scheduled Generation: The act or process of producing electric energy from other forms of energy; also the amount of electric energy so produced.

Spinning Reserve: Unloaded and available capacity of generating facilities synchronized to the interconnected electric system where automatic control action will cause such generating capacity to assume load.

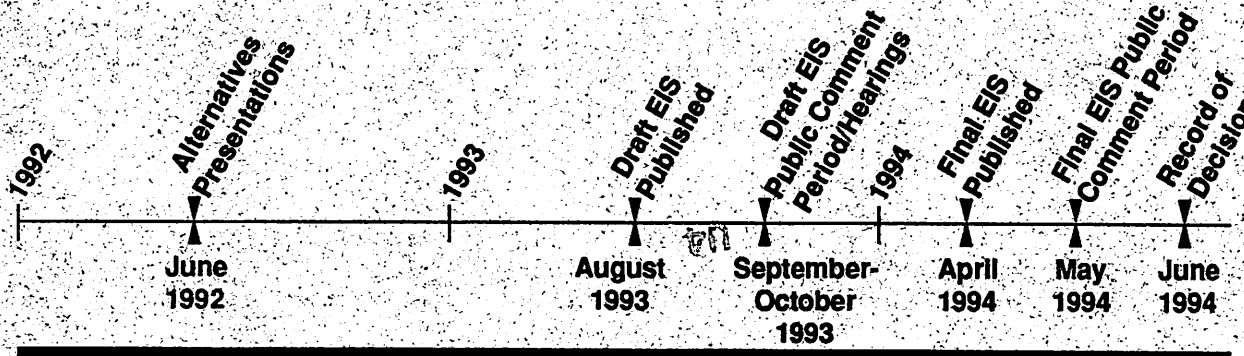
Supplemental Power: Any extra power that is purchased to help cover firm loads in lieu of supplying the power from our own resources.

System Time Error: The difference between system frequency and standard time as derived from the U.S. Bureau of Standards.

Tie-line Loading: The flow on the transmission lines between control areas.

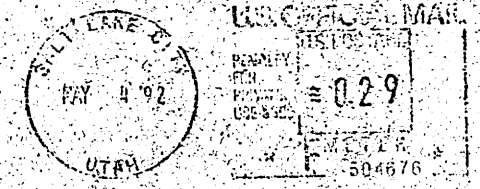
Upramp: Increase in generation with a corresponding increase in water release.

Watt: The electrical unit of power or rate of doing work. A kilowatt equals 1000 watts, a megawatt equals 1,000,000 watts, etc.



Electric Power Marketing EIS Timeline

Western Area Power Administration
P.O. Box 11606
Salt Lake City, UT 84147



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RAYMOND GREEN, MD
375 EAST 200 NORTH
HEBER, UT 84032